

**IN THE CLAIMS:**

Please amend claims as follows.

1. (currently amended) A method for producing Ti or a Ti alloy through reduction by Ca, the method comprising:

a reduction step of holding a molten salt in a reactor vessel, said molten salt containing  $\text{CaCl}_2$ , Ca being dissolved in said molten salt, and of reacting a metallic chloride containing  $\text{TiCl}_4$  with Ca in the molten salt by introducing the metallic chloride into the molten salt to generate Ti particles or Ti alloy particles in said molten salt;  
[[and]]

a separation step of separating the Ti particles or Ti alloy particles, generated in said molten salt, from said molten salt;

an electrolysis step of electrolyzing  $\text{CaCl}_2$  to generate Ca and  $\text{Cl}_2$ , the  $\text{CaCl}_2$  being produced as a by-product in association with the generation of Ti particles or Ti alloy particles and being discharged outside said reactor vessel;

wherein the Ca generated by said electrolysis step, is returned, along with the molten salt containing  $\text{CaCl}_2$ , to the reduction step so as to be used for the generation reaction of Ti or the Ti alloy in the reactor vessel.

2. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 1, wherein said molten salt containing  $\text{CaCl}_2$  is a molten salt containing  $\text{CaCl}_2$  and  $\text{NaCl}$ .

3-7. canceled

8. (original) A method for producing Ti or a Ti alloy through a reduction reaction by Ca, the method comprising:

a reduction step of holding a molten salt in a reactor vessel, said molten salt containing  $\text{CaCl}_2$ , Ca being dissolved in said molten salt, and of reacting a metallic

chloride containing  $TiCl_4$  with Ca in the molten salt to generate Ti particles or Ti alloy particles in said molten salt;

a discharge step of discharging the molten salt outside said reactor vessel, the molten salt being used for the generation of said Ti particles or Ti alloy particles;

a Ti separation step of separating said Ti particles or Ti alloy particles from the molten salt inside said reactor vessel or outside said reactor vessel;

an electrolysis step of electrolyzing the molten salt to generate Ca, the molten salt being discharged outside said reactor vessel; and

a return step of introducing Ca solely or along with the molten salt into said reactor vessel, Ca being generated by said electrolysis,

wherein a Ca source is circulated.

9. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 8, wherein, in said return step, Ca generated by the electrolysis is dissolved in the molten salt and introduced into said reactor vessel, Ca being generated by said electrolysis.

10. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 8, wherein the Ti particles or Ti alloy particles generated in the reactor vessel is discharged along with said molten salt outside the reactor vessel in said discharge step, and wherein the Ti particles or Ti alloy particles is separated from the molten salt discharged outside the reactor vessel in said Ti separation step, and wherein the molten salt from which the Ti particles or Ti alloy particles is separated and removed is electrolyzed in said electrolysis step.

11. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 8, comprising a chlorination step of reacting  $Cl_2$  with  $TiO_2$  to generate  $TiCl_4$ ,  $Cl_2$  being of a by-product in said electrolysis step,

wherein  $TiCl_4$  generated in the chlorination step is used for the generation reaction of Ti or the Ti alloy in the reactor vessel.

12. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 8, wherein said molten salt is a mixed molten salt containing  $\text{CaCl}_2$  and  $\text{NaCl}$ .

13. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 12, wherein said mixed molten salt contains  $\text{CaCl}_2$  and  $\text{NaCl}$  with a mixed ratio so that the melting point becomes  $600\text{ }^{\circ}\text{C}$  or lower, and said mixed molten salt is maintained at the temperature of not less than the melting point and not higher than  $600\text{ }^{\circ}\text{C}$  in at least said reduction step.

14. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 13, comprising a Na separation step of generating Na, while the molten salt discharged from said reactor vessel is maintained at a temperature of higher than  $600\text{ }^{\circ}\text{C}$  before the molten salt is supplied to said electrolysis step, and of separating and removing Na thus generated.

15. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 8, wherein said metallic chloride containing  $\text{TiCl}_4$  is a mixture containing  $\text{TiCl}_4$  and other metallic chloride.

16. (original) A method for producing Ti or a Ti alloy through reduction by Ca according to claim 8, wherein, by holding the molten metal containing Ca on the molten salt in the reactor vessel, Ca is supplied from said molten metal to said molten salt, located in a lower portion.

17. (original) A method for producing Ti through reduction by Ca, the method comprising:

a reduction step of holding a molten salt in a reactor vessel, said molten salt containing  $\text{CaCl}_2$ , Ca being dissolved in said molten salt, and of reacting a metallic

chloride containing  $TiCl_4$  with Ca in the molten salt to generate Ti particles in said molten salt; and

a separation step of separating the Ti particles, generated in said molten salt, from said molten salt,

wherein a Ca concentration C (mass %) of the molten salt in said reactor vessel is  $C > 0$  mass % and a temperature of the molten salt ranges from 500 to 1000 °C.

18. (original) A method for producing Ti through reduction by Ca, in which a molten salt whose Ca concentration is increased is used for reduction of  $TiCl_4$  in a reduction step, the molten salt being generated in an electrolysis step, the method comprising:

the reduction step of holding a molten salt in a reactor vessel, said molten salt containing  $CaCl_2$ , Ca being dissolved in said molten salt, and of reacting a metallic chloride containing  $TiCl_4$  with Ca in the molten salt to generate Ti particles in said molten salt;

a separation step of separating the Ti particles, generated in said molten salt, from said molten salt;

a separation step of separating the Ti particles, generated in said molten salt, from said molten salt; and

the electrolysis step of increasing the Ca concentration by electrolyzing the molten salt in which the Ca concentration is decreased in association with the generation of the Ti particles,

wherein a Ca concentration C (mass %) of the molten salt in said reactor vessel is  $C > 0$  mass % and a temperature of the molten salt ranges from 500 to 1000 °C.

19. (previously presented) A method for producing Ti through reduction by Ca according to claim 17, in which the Ca concentration C (mass %) of the molten salt in said reactor vessel is  $\geq 0.005$  mass %, the temperature of the molten salt ranges from 550 to 950 °C, and a relationship between said Ca concentration C (mass %) and the temperature of the molten salt satisfies the following formula (1):

$$C \geq 0.002 \times T - 1.5 \quad (1)$$

where T is a temperature (°C) of the molten salt in the reactor vessel.

20. (previously presented) A method for producing Ti through reduction by Ca according to claim 17, in which said molten salt containing  $\text{CaCl}_2$  is a molten salt containing  $\text{CaCl}_2$  and  $\text{NaCl}$ .

21. (original) A method for producing Ti through reduction by Ca according to claim 17, wherein  $\text{CaCl}_2$  which is of a by-product associated with the generation of Ti is discharged outside the reactor vessel.

22. (original) A method for producing Ti through reduction by Ca according to claim 21, comprising a step of electrolyzing  $\text{CaCl}_2$  extracted outside the reactor vessel into Ca and  $\text{Cl}_2$ , wherein Ca generated by the electrolysis step is used for a generation reaction of Ti in the reactor vessel.

23. (original) A method for producing Ti through reduction by Ca according to claim 18, comprising a chlorination step of reacting  $\text{Cl}_2$  with  $\text{TiO}_2$  to generate  $\text{TiCl}_4$ ,  $\text{Cl}_2$  being generated in the electrolysis step, wherein  $\text{TiCl}_4$  generated in the chlorination step is used for the generation reaction of Ti in the reactor vessel.

24. (new) The method for producing Ti or a Ti alloy through reduction by Ca according to claim 1, wherein a molten salt whose concentration is increased by the Ca generated in said electrolysis step is returned to the reactor vessel for the reduction step.